No 97 Ch.
S. E. arch & 10th.

An Inaugural Dissertation on Hydrothorax.

Copied March 1828

Submitted to the examination of the Professors of the University of Pennsylvania, for the Degree of

Doctor of Medicine,

by

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of

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Jany. 23d. 1827.

A law of this University renders it obligatory on all candidates for the Doctorate to write an essay on some subject connected with the Science of Medicine. In compliance with this requisition I now proceed to offer a few observations on Hydrothorax.

This disease may be defined a preternatural collection of serous or watery fluid in the Cavity of the Thorax. It is a well known fact to every Physiologist and Anatomist, that in a natural condition of the System there is constantly poured out a quantity of watery fluid, for the purpose of lubrication, into every cavity containing viscera, and every part subject to motion in the human body, enabling them to perform their functions in a perfect and healthy manner.

In order to prevent an accumulation of this fluid and its evil consequences, the same seems constantly to be removed, soon after its exhalation, by a set of vessels termed Absorbents, which, in health, answer this purpose effectually. A knowledge of the existence of this fluid is, I think,

sufficient for my present purpose: I therefore deem it unnecessary to enter into a discussion to prove whether this fluid is secreted by a set of vessels termed exhalants, or is an exudation through the pores in the coats of arteries, according to the French Physiologist, Richerand, — or to determine whether those exhalant vessels are minute extremeties of Arteries. —

The functions of those vessels are as necessary to perfect health as the exercise of any other functions in the Human body. — or to speak in the words of the lamented Rush, perfect health consists in the strife between those vessels and as soon as an armstice takes place between them disease occurs.

From these remarks it must be obvious that if the quantity of serous fluid poured out in any part be greater than the absorbents can remove a morbid collection ensues. — or if the amount poured out be no greater than usual, and the absorbents do not perform their duty, it is plain that an accumulation must also follow.

Thus the several forms of Dropsy, one of which is under consideration, may be occasioned either by a defect of absorp-

-tion or increased exhalation. The latter, however, I conceive to be in a majority of cases the Proximate cause of Dropsy, and to which I shall chiefly confine the observations I design making on the subject of this essay. —

Hydrothorax may be divided into Symptomatic and Idiopathic, proceeding from a local or general cause, and like other forms of Dropsy may occur in two States of the system, Tonic and Atonic.

Increased exhalation, forming a collection of water in the Thorax, is generally the result of vascular excitement in the Chest, and this state, according to the degree of it, may produce different results — when of a high degree, coagulable lymph is thrown out — State higher, a Secretion of pus — and that State which produces an effusion of Serum is of the lowest grade of inflammation.

The inflammation terminating in a Secretion of Serum may arise from particular diseases within the Chest, as Ossification of the Valves of the Heart, Coronary vessels, or of the Coats of the large adjacent vessels, aneurismal tumours, &c.

Dropsy of the Chest may be independent of the presence of any organic disease, creating an excitement peculiar to the secretion of serum, as inflammation from Cold, frequent attacks of Asthma and Catarrh, misplaced Gout, Dyspepsia, &c. or should the means for subduing a high state of inflammation not be early enough employed, or in an insufficient degree, a lower or Chronic form of inflammation may remain and pro-duce an aqueous effusion, or as an effect of the higher ex-citement some structural disease, eventuating in an effusion.--

In addition to these ordinary exciting causes of the inflam-mation favourable to the production of serum - there is a certain congestive or plethoric state of the circulation brought on in particular habits - by indulging in the pleasures of the table, and little exercise, which prevailing in the Chest may occasion an excitement in the serous tissues of the Chest so as to produce an accumulation of serous fluid.

I have said this disease may be found in an Atonic state of the System - and here I presume an in-creased effusion arises from a relaxed state of the

exhalants proceeding from a weak morbid action of the heart and arteries.

In common with other forms of Dropsy, Hydro-thorax may be owing to a defect of absorption. It seems reasonable to conclude that a certain degree of tone or activity of the absorbents is necessary to the perfect performance of their duty, and that their natural tone may be destroyed by the same debilitating causes that precedes a laxity of the exhalants. —

From these remarks on the causes of Hydrothorax I proceed to the Consideration of the Symptoms arising from the pressure of the water upon the Vital Organs contained in the Chest, producing a disturbance in their functions. These I shall relate as recorded by Cullen.

Hydrothorax frequently comes on with a sense of anxiety about the lower part of the Sternum. This before it has subsisted long comes to be joined with some difficulty of breathing, which, at first, appears only upon the person's walking upon an acclivity or upon his ascending a stair case-

but after some time this difficulty of breathing becomes more constant and considerable, especially during the night when the body is in a horizontal posture.

Commonly at the same time lying upon one side is more easy than upon the other, or perhaps lying upon the back more easy than upon either side. These circumstances are usually attended with a frequent cough, that is at first dry; but which after some time is accompanied with an expectoration of thin mucous. There is at the same time an oedematous swelling of the feet and legs, thirst, paleness of the face, and a scarcity of urine.

"Soon after the patient falls asleep he is suddenly awaked with a sense of anxiety and difficulty of breathing, and with a violent palpitation of the heart. These feelings immediately require an erect posture." A fluctuation of waters may be perceived by the patient himself, or by the Physician in certain motions. Pulse irregular and frequently intermittent.

This disease bears some analogy to other affections

of the breast, but may in most cases be distinguished by proper attention to the symptoms characteristic of these affections. —

The following tests are related by Bichat and Corvisart. The first tells us that pressure on the abdomen increases the sense of suffocation and other bad symptoms of Hydrothorax; and the latter says that by placing the patient in an erect posture and then striking one side of the Chest, while the hand is placed on the other we may ascertain clearly the accumulation of water by the sensation of fluctuation which this process imparts. —

If the fluctuation could be thus ascertained it certainly would be a decisive test of this formidable disease — but from the peculiar formation of the Chest I should think it extremely difficult to discover the presence of water by the usual test in Ascites — the ribs and short intercostal muscles not allowing the water to extend itself outwardly or the fingers to feel any fluctuation: but that the patient on turning from one side to the other may feel the sensation

as if water was contained in the Chest can more readily be conceived.

The patient being suddenly aroused from sleep by a sense of suffocation &c. has been considered by Boglivi, Carolus Piso, Reimanus and other respectable authors, as a certain Diagnostic of the presence of water in the Chest. And Jo. Jacobi. Vicarius "believed he could swear" says Morgagni, that from this symptom in particular the patient laboured under Dropsy of the Thorax; yet on the post Mortem examination of the thorax of a patient who ~~labour~~ had it in a degree, he found not the least drachm of serous fluid either in the left or right Cavity; an which he cried out with an ingeniousness never sufficiently to be commended, and fule of wonder, Oh how fallacious sometimes are Diagnostics.

It is contended by others that this symptom is sometimes observed to attend disorders unaccompanied by serous effusion, and therefore no reliance is to be placed on it alone, but when joined with other symptoms which indi-

-cate the presence of water in the chest, points out with more certainty the nature of the disease.

Maclean says, when respiration is considerably imped-
-ed, especially on motion, in a horizontal posture, or on as-
-cending an acclivity; when the countenance is at the same time pale and sallow, assumes a leaden or livid hue; the urine small in quantity, high coloured, and on cooling de-
-posits a reddish or pink coloured sediment; pulse irregular or intermittent; the feet, ankles, or hands swell and are colder than natural; and the patient is suddenly rous-
-ed from sleep by a sense of suffocation or extreme anxiety about the precordia, attended with palpitation — the most superficial observer will have no doubt of the presence of watery fluid in some of the cavities of the Thorax.

The diseases with which Hydrothorax is likely to be con-
-founded are, Empyema, Asthma, Organic affections of the heart, or aneurismal dilitations of the large vessels connected with it.

It is but reasonable to admit that some of the symp-

-toms succeeding an accumulation of water in the Chest, as difficulty of breathing, Oedematous feet, Scarcity of urine, and violent palpitation arousing the patient during Sleep, may also arise from a collection of pus in the same cavity. But the latter may be distinguished by its being preced-ed by the Ordinary Symptoms of Pleurisy or Pneumonic inflammation receding without the Signs of resolution, but with those of Suppuration, such as a remission or cessation of acute pain and fever, and their degenerating into a dule ob-tuse sensation, occasional rigors followed by heat, and a copious whitish or reddish Sediment in the urine, and the absence of other Dropsicae Symptoms which arise from these acute affections terminating in Serous effusion, its being accompanied with hectic Symptoms, and particular-ly an attentive observance to the Circumstances which precede each.

From Asthma it may be distinguished by the respir-ation in Asthma being performed with a peculiar wheez-ing noise, and not so quick and hurried as in Hydrothorax,

and the Stricture across the breast being greater, and from its returning in Paroxysms attended with a dry Cough, and continuing for a certain time going off gradually, or with considerable remission, with free expectoration and profuse perspiration.

Aneurismal dilitations of the large vessels near the heart sometimes occasion many of the Symptoms of Hydro-thorax, but a pain and throbing in the seat and direction of some of the large Arteries increased by causes which accelerate the circulation of the Blood may serve to distin-guish it from this disease.

Polysarcia may give rise to some of the Symptoms of Hydrothorax, especially difficult breathing, palpitation and the sudden Starting up from Sleep, arising from a quantity of fat surrounding the Heart and consequently impeding its free action. If there is no diminution in the quantity of urine, no external dropsical swelling and other signs of dropsy, the increased bulk of the body may in-dicate the real nature of these symptoms.

Hydrothorax occasionally ends in general dropsy, and it is sometimes accompanied from the beginning with universal dropsy; but in general the accumulation increases to such an amount as to render the respiration more and more difficult untile the action of the Heart and Lungs is entirely impeded, and the patient is destroyed apparently from suffocation, before universal dropsy takes place.

The fatal termination of this disease is sometimes sudden, which may be accounted for, when we consider the organs effected, and in others is preceded for a few days previous to death by a spitting of blood. —

I shale now proceed to the treatment of this complaint. The first thing that requires attention is the reduction of the inflammatory action, indicated by the pulse, pain, difficulty of breathing, Cough, &c.

For this purpose bloodletting is the most efficient. It acts by diminishing the vascular action from which the effusion emanates, and by increasing the activity of the absorbents. But as mentioned by Home the pulse to the end

seems active and would indicate the loss of more blood, therefore this circumstance alone should not determine the necessity of continuing the lancet; other connected circumstances of the case should be taken into view.

After the use of the lancet the application of cups to the thorax is recommended by Ayre, and may be resorted to with utility; they are said to be more beneficial when applied to the back or shoulders.

Blisters. At the same time recourse is had to these means, a large blister is to be applied so as to cover the whole Chest, and the discharge kept up by the application of some stimulating ointment, as the Ceratum Salina, or Ceratum Cantharidum; or the renewal of the blister as soon as it begins to heal. — Setons and issues have been recommended but are considered as inferior to the vesicatory applications. —

Diuretics: These are important remedies, and after the reduction of inflammatory action are next to be administered. Of this class the following are the most useful, viz: Squills, Digitalis, Cantharides, Colchicum, nitrate and super-

-tartrate of Potash.

The powder and vinegar of Squills were held in high estimation by Galen and Celsus, and others of the ancients in Hydrothorax, and their being in use from those periods to the present day, present strong proofs of their superior virtues. Its possessing besides its diuretic properties, those of an expectorant, enhances its value.

When combined with Calomel in the following proportions its effects are more beneficial.

℞ Squill pulv. grs. ij or iij
Calomel " j

which is to be made into a pill and given morning and evening. Should an undue purging follow the use of this combination it may be restrained by the addition of a small quantity of Opium. Ptyalism necessarily follows the use of this combination. When the case is not violent the squill may be given by its self.

Digitalis. This remedy is lightly spoken of by some while others speak highly of its virtues in Hydrothorax.

It is in the atonic state of the system that it is useful.

Cantharides. In combination with Squill, as in the following formula, this article is recommended by Doct. Smith of Yale College, in this species of Dropsy.

℞. Squills ℈j.
Cantharides gr. V to X
Castile soap ℈j m̄ and make the mass into ten pills, one of which is to be given morning and evening. —

Colchicum Autumnale. This article was at one period held in high estimation, especially the oxymel, but like many other articles of the Materia Medica was condemned, unjustly, to descend to the tomb of the Culprits. Of late, however, it appears to be recovering its lost reputation — and does good by the combined operation of its Diuretic and expectorant powers.

The powers of Elaterium in Hydrothorax, the name given to the juice of the plant, Cucumis Agrestis, by Dioscorides, has once more been revived by Ferriar of Manchester.

As the result of a series of clinical experiments instituted by him, the following combination he reports as the most active and efficacious diuretic in Hydrothorax. —

℞ Elaterium, gr. j.
Sp. æther. nitros. ℥ij.
Tinct. scill.
Oxymel. colchic. aa ℥ss.
Syrup ramni, ℥j. Ft. Solut.

One drachm of which is to be given every two or three hours. — The illustrious Professor of the Practice, Dr. Chapman, has found the following mixture still more effectual. —

℞. Gamboge — — gr. iv.
Elatin. — — ʒ ss.
Spt. nitr. dulc. ℥iv
Aq. font. — ℥iv. m.

One table spoonfull of which is to be given every two hours. — When these articles fail in producing an increased flow of urine, other articles of this class must be used. — Purgatives, except to keep the bowels in a soluble condition

are not applicable in this form of Dropsy; they do not here promote absorption, and are apt to increase debility, while the dyspnœa and other distressing symptoms are aggravated; and experience has shown that all evacuations of the Alimentary Canal in affections of the Pulmonary Organs are injurious.

Emetics are also deemed inapplicable in this Species of Dropsy – tho' by some are considered useful in nauseating doses.

Such are the remedies and the order in which they are to be used in Hydrothorax. If after their use for a sufficient time they fail in evacuating the water, the operation of Paracentesis may be resorted to.

This means of evacuating the water is of ancient date as the days of Hypocrates, and is to be performed by making an incision about two inches long between the sixth and seventh ribs, equi distant from the Spine and Sternum. The incision is to be made with a common scalpee through the integuments and an incision smaller

than the external one is to be made through the intercostal muscles which exposes the pleura costalis, and a small puncture through it will give passage to the water. A depending posture is necessary to give free vent to the water. After the evacuation the wound is to be closed by adhesive straps.

During the use of Diuretics the patient is to avoid warmth, and drink plentifully of diluent drinks in order to promote their operation. —

The diet, except when atonic, should be low, easy of digestion, and well masticated, and the motion of the diaphragm should never be interrupted by a full meal.

Should we be so fortunate as to remove the effused fluid, the patient should take daily exercise, which, together with the influence of a salubrious atmosphere will contribute to give tone and vigour to the whole system.

Thus Gentlemen I have endeavoured to arrange some remarks on the subject of Hydrothorax – imperfect

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as they are I submit them to your examination, and hope that my inability to say any think from experience will plead something in their excuse.

It now remains for me Gentlemen (Should I be so fortunate as to find my examination meet your approbation) to bid an Adieu! to you the illustrious Professors of Medicine in the University of Pennsylvania, and in performance of this deem it my duty to present to them my thanks for the many important lessons received from them in their lectures, and my fervent wishes that they may long continue to be an honour to the Science which they teach, and a blessing to all Mankind.